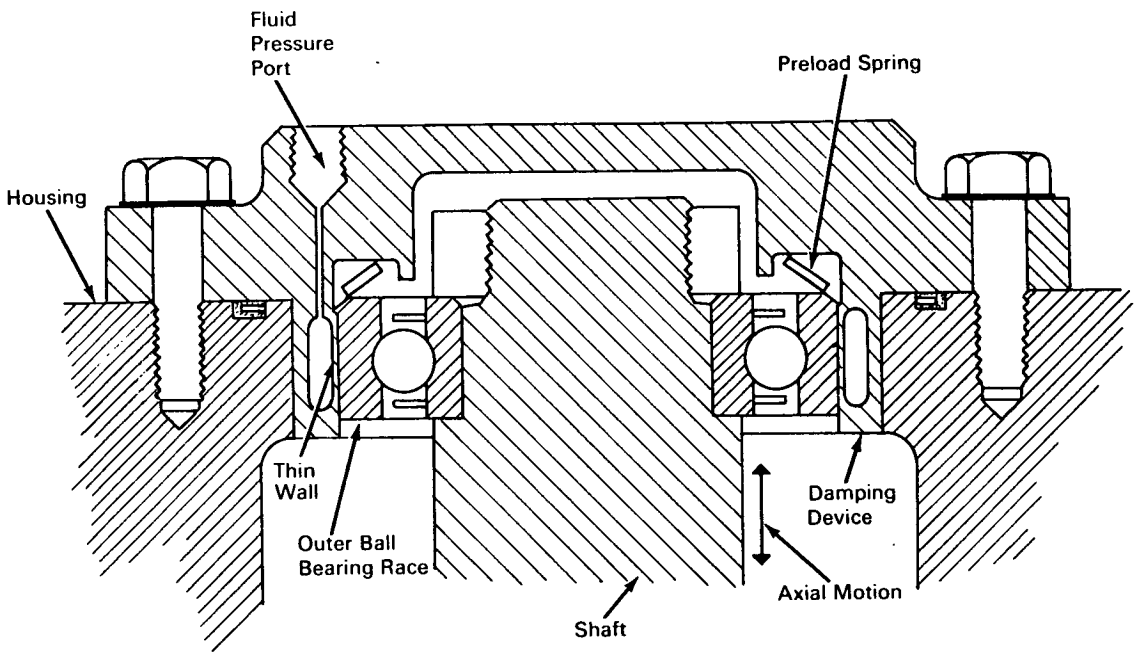
January 1966

Brief 66-10030

NASA TECH BRIEF

Friction Device Damps Linear Motion of Rotating Shaft



The problem:

To design a device that will exert a controllable force to damp the axial motion of a rotating shaft. The damping characteristics of the device must not be affected by clearance changes and temperatures over a wide range of operating conditions.

The solution:

A damping device that applies a controllable, radial frictional load to the outer race of the ball bearing in which the shaft is mounted.

How it's done:

The damping device incorporates a hollow torus that fits with a small clearance around the outer race of the ball bearing. A controlled fluid pressure admitted into the annular space within the torus exerts a radially inward pressure and causes the thin wall to bulge against the surface of the outer ball bearing race. The resulting frictional force between the contacting surfaces acts to damp the axial motion of the shaft. This force is proportional to the applied fluid pressure. The contacting surfaces may be coated with a dry film lubricant to equalize static and kinetic friction.

Notes:

1. This device can also be used as a "soft" bearing mount to damp resonant frequencies at critical shaft speeds.

(continued overleaf)

2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Western Operations Office
150 Pico Boulevard
Santa Monica, California, 90406
Reference: B66-10030

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code AGP, Washington, D.C., 20546.

Source: North American Aviation, Inc.
under contract to
Western Operations Office
(WOO-214)